

FACT SHEET
MODIFICATION OF THE GENERAL VPDES PERMIT
FOR READY-MIXED CONCRETE PLANTS

The Virginia State Water Control Board has under consideration the modification of the general VPDES permit for point source discharges from the ready-mixed concrete industrial category to surface waters. This modification will add coverage for Standard Industrial Classification (SIC) Codes 3271 (Concrete Block and Brick) and 3272 (Concrete Products, Except Block and Brick) to the general permit VAG11, which became effective on October 1, 2003, and will expire on September 30, 2008. Facilities under SIC Codes 3271, 3272, and 3273 (Ready-Mixed Concrete) are collectively defined as "Concrete Products Facilities".

Permit Number: VAG11

Name of Permittee: Any owner of a concrete products facility in the Commonwealth of Virginia agreeing to be regulated under the terms of this general permit.

Facility Location: Commonwealth of Virginia

Receiving Stream: Surface waters within the boundaries of the Commonwealth of Virginia, except those specifically named in Board Regulations and Policies which prohibit such discharges. Discharge to surface waters may be through a municipal separate storm sewer system.

On the basis of preliminary review and application of lawful standards and regulations, the State Water Control Board proposes to modify the general permit subject to certain conditions and has prepared a draft permit modification. The Department of Environmental Quality has determined that this category of discharges is appropriately controlled under a general permit. The category of discharges to be included involves facilities with the same or similar types of operations and the facilities discharge the same or similar types of wastes. The draft of the general permit modification requires that all covered facilities meet standardized effluent limitations and monitoring requirements, and that all covered facilities develop a site-specific storm water pollution prevention plan.

Persons may comment in writing on the proposed general permit modification within 60 days from July 25, 2005. Comments should be addressed to the contact person listed below. Comments shall include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered by the Board.

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Valerie Rourke at:

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A public hearing will be held on this draft permit modification on August 30, 2005. Notice of the public hearing will be published in the newspaper and in the Virginia Register. Following the public comment period, the Board will make its determination regarding the proposed modification.

Proposed Modifications to the Ready-Mixed Concrete General Permit

This general permit currently covers point source discharges of process wastewaters and storm water runoff associated with the operation of ready-mixed concrete plants where the primary

industrial activity is classified as SIC Code 3273. The purpose of this modification is to add permit coverage for SIC Codes 3271 (Concrete Block and Brick) and 3272 (Concrete Products, Except Block and Brick) to the general permit. Facilities operating under SIC Codes 3271, 3272, and 3273 are collectively defined as "Concrete Products Facilities". This general permit does not exclude the coverage for a concrete products facility with a secondary industrial activity (i.e., other than SIC 3271, 3272 or 3273) co-located on site as long as the secondary activity does not generate any point source discharges. Coverage includes concrete products facilities, temporary ready-mixed plants erected on or near construction sites, vehicle/equipment maintenance activities at concrete products facilities, waste concrete reclamation, cement and aggregate unloading by rail and barge at concrete products facilities, and road salt storage.

Process Descriptions and Waste Characterizations

A. SIC 3271 - Concrete Block and Brick

Concrete block and brick are classified into the following products: structural block produced with lightweight aggregate such as cinder, expanded shale, pumice or other materials; structural block produced with heavyweight aggregate such as sand, gravel, crushed stone or other materials; decorative block - such as screen block, split block, slump block and shadowal block; and concrete brick.

The manufacturing process for concrete block and brick consists of mixing, forming, and curing. Typically, the aggregate, cement and water are weighed and mixed in batches of about four cubic yards in a rotary mixer. The concrete mix used for production of block and brick contains less water than ready-mixed concrete. The type of aggregate being used will determine if a lightweight or heavyweight product is produced. Color may be added to the mix to produce decorative block. The mixed concrete is fed into an automatic block molding machine, where the moist mix is rammed, pressed or vibrated into the desired shape. Following forming, the material is stacked onto iron framework cars and allowed to cure. To produce a structural high-strength block within a reasonable time period, the block must be cured under moist conditions. The three basic methods of curing are: (1) atmospheric; (2) low pressure steam; and (3) autoclave or high pressure steam.

Atmospheric curing produces a lower strength block than the other two methods of curing. Atmospheric curing uses ambient heat and humidity, and heat of hydration to cure the block, and also includes curing within enclosures at ambient conditions. Curing usually takes place for about four hours. There are no additional wastewaters produced from this curing process.

In the low pressure steam method, the loaded curing cars are placed into a chamber or kiln where low pressure steam less than 150 psi is injected from perforated pipes for approximately 8-10 hours, depending on mix conditions, user specifications, and ambient temperature. Waste water from this curing method consists primarily of steam condensate, which contains some suspended solids, dissolved solids, COD, oil and grease and a high pH. The low pressure steam is generated by a boiler which requires periodic blowdown.

The autoclave or high pressure steam curing method produces a higher strength block with less shrinkage in less time than the low pressure steam curing method. For this method the curing cars are loaded in a large horizontal, cylindrically shaped autoclave where high pressure steam (greater than 150 psi) is injected or convected. After a curing cycle of about 8 hours the steam is released to the atmosphere and the blocks are removed and stored. An alternative method of steam production uses a hot oil convection method, where water is placed in a trough within the autoclave and hot oil heats the water into steam. Following curing, the autoclave is allowed to cool and a portion of the steam condenses back into the trough. Periodically the trough water is discharged because the alkalinity, due to the pickup of calcium oxide, makes the water corrosive to the steel racks of the curing cars. Wastewater discharges from the autoclave

curing process can include boiler blowdown, autoclave blowdown condensate, and autoclave purge. Pollutants include suspended solids, COD, oil and grease, and high pH, resulting from autoclave blowdown condensate and in the convection process, autoclave purge.

The primary source of wastewater from concrete block and brick facilities is equipment wash-off, including: delivery trucks, conveyor belts, transport buckets, central mixers and forms. Generally only suspended solids are a problem in this wastewater and can be handled with simple settling. Other potential sources of wastewater include: accidental spill wash-down, storm water runoff, and noncontact cooling of bearings and compressors. Spill wash-down and storm water runoff can be handled with other wash-waters. The noncontact cooling water (and other clean wastewater) can be used for mixing water makeup, aggregate moisture control, and yard dust control.

B. SIC 3272 - Concrete Products, Except Block and Brick

Concrete Products, Except Block and Brick include concrete pipe, precast concrete products, and prestressed concrete products.

Concrete Pipe. Concrete pipe products include: culvert pipe (reinforced and non-reinforced), storm sewer pipe (reinforced and non-reinforced), sanitary sewer pipe (reinforced and non-reinforced), pressure pipe (reinforced, prestressed, pretensioned and other pressure pipe), irrigation pipe and drain (tile), and other concrete pipe (e.g., manholes and conduits).

Concrete pipe is generally produced by three methods: (1) the vertical packerhead (tamping) method; (2) the vertical cast method; and (3) the spin casting production method. The vertical packerhead method uses a machine called a packerhead to compact and vibrate a moist concrete mix into a steel form. The method is used to produce pipe up to five feet in diameter. The vertical cast method is used to produce reinforced pipe. Due to labor cost and time, this method is generally limited to production of reinforced pipe over five feet in diameter. A wet concrete mix from a central mixer is transported by buckets and poured into a vertical steel form containing a reinforcing cage. The steel forms are stripped from the pipe after the concrete sets. The spin casting production method is used to produce reinforced pipe up to four feet in diameter. The form containing a reinforcing cage is placed horizontally and rotated at a high rate, while concrete is added by a reciprocating nozzle. The spinning action densifies the concrete on the inside of the form and dewateres it. The inner surface of the pipe is finished by a mechanical roller. Reinforced concrete pressure pipe, produced by spin casting, uses a hydraulically tested sheet steel cylinder form that remains as part of the finished pipe.

All concrete pipe is cured at ambient conditions or spray cured, until it reaches a certain green strength, at which time it is cured by low pressure steam either in a kiln or in a chamber constructed around the pipe. For pipe produced by the packerhead method, the forms are usually removed before steam curing, while for the vertical cast and spin casting methods the forms usually remain on the pipe during curing. In all cases except reinforced concrete pressure pipe, a form release oil is used. In the production of reinforced concrete pressure pipe additional processes include: hydraulic testing of the cylinder, wrapping the cured pipe with high strength steel wire, and coating the steel wire wrap with concrete grout. There is no waste water from atmospheric curing. Waste water from steam curing and spray curing contains suspended solids, oil and grease and has a high pH.

Precast Concrete Products. Precast concrete products include: roof and floor units (slabs and tile; joints and beams); architectural wall panels; pilings, posts and poles; cast stone (products for architectural purposes); prefabricated building systems; other precast construction prod.; burial vaults and boxes; silo staves; septic tanks; dry-mixed concrete materials (e.g., Sakrete); other precast (e.g., laundry tubs).

Simple precast concrete products are produced by pouring the concrete from a mixer into steel forms, and allowing the product to cure, either at ambient conditions, with low pressure steam, or with a water spray. Curing takes place in two steps, first with the form on then off. The second curing step usually takes place at ambient conditions. Reinforced concrete products contain steel structural members to provide increased strength.

Precast architectural wall panels are generally finished to produce a decorative surface of exposed aggregate. For the most common production method, a retarder is spread in the form bottom, reinforcing steel is placed in the form, and the concrete mix is cast. When the concrete has set and the form is removed, the surface is washed with a weak acid solution, sandblasted, or washed with high pressure water to clean away the unset surface cement and expose the coarse aggregate. The panel is then cured completely in a storage yard.

Prestressed Concrete Products. Prestressed concrete products are chiefly used as structural and architectural components and include: single tees, double tees, and channels; piling, bearing piles, and sheet piles; bridge beams; solid and hollow cored slabs and panels; other prestressed products (e.g., arches); joist, girders, and beams (other than bridge beams).

Prestressed concrete products are produced in similar fashion as precast reinforced concrete products with the substitution of steel cables under tension instead of steel rods for reinforcement. Prestressed concrete products may be either pretensioned or post-tensioned.

The wastewater discharge from Concrete Products, Except Block and Brick facilities includes transport bucket and central mixer washout, form wash-off, condensate from steam curing, spray curing wastewater, surface finishing water, spin cast wash-water, pre-wetting of imbedded pressure pipe, storm water, boiler blowdown, noncontact cooling water from bearings and compressors, and miscellaneous equipment wash-off. Pollutants in the wastewater discharge includes suspended solids, oil and grease, high pH, and COD.

Effluent Limitations and Monitoring Requirements

The sources of wastewater and the pollutants of concern for Concrete Block and Brick facilities and Concrete Products, Except Block and Brick facilities are, for all intents and purposes, identical to the wastewater sources and pollutants of concern for ready-mixed concrete plants (details regarding the sources of wastewater and the pollutants of concern for ready-mixed concrete plants are contained in the Fact Sheet for the existing Ready-Mixed Concrete General Permit that was reissued in 2003). As such, no additional or amended effluent limitations or monitoring requirements are proposed for this modification.

Proposed Special Conditions and Their Basis

The following special conditions are proposed to be amended for this modification:

4. Restrictions of washing activities.

Modified the first part of the requirement to list all the washdown and washout restrictions that EPA listed for concrete products facilities in Sector E of their NPDES Storm Water Multi-Sector General Permit that was reissued on October 30, 2000. The list in the existing permit only covered ready-mixed concrete plants.

6. Prohibition of sewage discharge.

Added the word "domestic" before "sewage discharges" to clarify that domestic sewage discharges are not permitted under this general permit.

Requirements for Storm Water Management

The sector-specific storm water management requirements for Sector E (Glass, Clay, Cement, Concrete, and Gypsum Products Facilities) that were developed by EPA for their NPDES Storm

Water Multi-Sector General Permit that was reissued on October 30, 2000, were incorporated into the existing Ready-Mixed Concrete General Permit during the 2003 reissuance. Therefore, no additional requirements are proposed for this modification.

General Permit Coverage

This general permit became effective on October 1, 2003, and will expire on September 30, 2008. The permit modification will become effective February 8, 2006. Every authorization under this general permit will expire at the same time and all authorizations will be renewed on the same date, provided a complete registration statement has been filed prior to the general permit's expiration date.

All persons desiring to be covered by this general permit must register with the Department by filing a registration statement and applicable fees. The registration statement shall be submitted and a notification of coverage issued prior to any discharges or other activities for which this permit is required.

Concrete products facilities that have not already received coverage under the Ready-Mixed General Permit, and that are discharging process wastewater and/or storm water associated with industrial activity to surface waters on the effective date of this general permit modification, and which have not been issued an individual VPDES permit, are required to submit the registration statement. Existing operations with individual VPDES permits that wish to seek coverage under the proposed general permit modification would have to file a registration statement at least 180 days prior to the expiration date of the individual VPDES permit. For all new concrete products facilities that will have discharges of process wastewater or storm water associated with industrial activity and that will begin activities after the effective date of this permit, the registration statement shall be filed at least 30 days prior to the commencement of operation of the concrete products facilities.

This general permit does not cover activities or discharges covered by an individual VPDES permit until the individual permit has expired or has been revoked. Any person conducting an activity covered by an individual permit, which could be covered by this general permit, may request that the individual permit be revoked and register for coverage under this general permit. Antibacksliding will be considered prior to granting the coverage under this general permit. Any owner or operator not wishing to be covered or limited by this general permit may make application for an individual VPDES permit, in accordance with VPDES procedures, stating the reasons supporting the request. This general permit will not apply to any new or increased discharge that will result in significant effects to the receiving waters. The determination is made in accordance with the State Water Control Board's Antidegradation Policy contained in the Virginia Water Quality Standards, 9 VAC 25-260-30.

All facilities that the Department believes are eligible for coverage under this general permit will be authorized to discharge under the terms and conditions of the permit after a complete registration statement is submitted, the applicable permit fee is paid, and the Department sends a copy of the general permit to the applicant. If this general permit is inappropriate, the applicant will be so notified and the requirement that an individual permit or alternate general permit is needed will remain in effect.